

COVID-19: MOBILISING EXPERTISE FOR IMPACT



Photo courtesy of Getty Images

In the face of a global pandemic, University of Newcastle experts team up with health and industry partners to create solutions for its communities.

The first cases of COVID-19 in Australia were detected in late January 2020. By mid-March the number of coronavirus cases was increasing at a rate that could have overwhelmed our healthcare system in a matter of weeks – as it had done across Italy, Spain and the United States.

Global shortages of personal protective equipment (PPE) such as gloves, medical masks, respirators, goggles, face shields, gowns and aprons were leaving frontline health workers dangerously ill-equipped to care for COVID-19 patients.

In March 2020, the World Health Organisation suggested global manufacturing of PPE would need to increase by 40 percent to meet the rising demand.

Newcastle researchers mobilise

Given the Newcastle region is home to several public and private hospitals, University of

Newcastle researchers were fielding growing enquiries from frontline health teams who needed support with the manufacturing and supply of PPE equipment locally.

Within days, the University of Newcastle had mobilised a team of researchers across health, science and engineering to respond.

The university also engaged with major health partners including the Hunter New England, Mid North Coast and Central Coast local health districts as well as the Calvary Mater Newcastle Hospital.

The COVID response teams worked quickly to develop scalable solutions. They also had to ensure effective and frequent communication with partners while guarding against duplication of effort.

Within weeks, the teams delivered a range of practical yet invaluable solutions.



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Hand sanitiser

The capacity to produce large amounts of hand sanitiser requires the ability to store significant quantities of dangerous goods like ethanol. The Hunter Medical Research Institute (HMRI) – a partnership between the university and the Hunter New England Local Health District – is home to the only substantial storage facility for flammable goods in the Hunter region.

When the Therapeutic Goods Administration (TGA) excluded specified hand sanitisers from regulation in late March, HMRI's Facilities Management Team began producing hand sanitiser for local health districts, with University of Newcastle staff facilitating procurement and volunteering their time to support production.

Face shields

Newcastle physicists, engineers and designers worked alongside health workers to develop a prototype of face shields that could be manufactured rapidly.

Already experienced in the development and production of advanced medical devices, the university's Priority Research Centre for Organic Electronics took on the challenge.

The centre was able to re-purpose polyethylene terephthalate (PET) from the production of their commercial printer to make the face shields.

Guru Labels on the Central Coast supported the process by laser cutting the PET in bulk, while the Australian National Fabrication Facility team (based at the University of Newcastle) contributed to building the shield assembly line.

Ventilators

In March 2020, NSW Health contacted Ampcontrol – a company with a long history of engagement with the university – and posed a challenge to create an emergency ventilator prototype within 28 days and ensure it could be produced at a rapid scale if needed.

Project lead Dr Ian Webster (Engineering Manager at Ampcontrol Group and University of Newcastle Conjoint Senior Fellow with the School of Electrical Engineering and Computing) contacted the university seeking expertise and access to facilities.

Professor Brett Ninnes from the Faculty of Engineering and Built Environment took that call, and soon a 30-strong team of engineers from Ampcontrol, the university, local engineering firms NewieVentures and Safearth, and even university alumni were hard at work.

Within 11 days, the team had developed its first working prototype. Within 18 days, they started testing it at John Hunter Hospital's simulation unit. Within six months, the team had pre-production and clinical user group testing.

In September 2020, Ampcontrol unveiled the fully developed emergency ventilator and announced the model would progress to the manufacturing phase, with components already ordered for up to 100 units to support NSW hospitals.

"What this rapid innovation health project has brought to the forefront...is what can be quickly achieved when there are strong partnerships between government, university, and industry." – Ampcontrol Managing Director and Chief Executive Officer Rod Henderson

Impact

The University's Covid Response Initiative has so far resulted in the production and distribution of:

- 300 litres of hand sanitiser to local health networks, with a commercial value of \$1,600 per 40-litre batch
- 2,000 face shields to frontline workers across the Hunter region

It also supported the development of a low-cost, life-saving backup ventilator which is heading to full-scale production.

While these results were in response to a global and local health crisis, the University of Newcastle can apply the model of engagement to any situation and any industry looking to tackle complex problems.

"We want the University of Newcastle and our regions to be the ultimate testbed for innovation. Our COVID-19 response shows that we have the capacity and expertise to bring people together and deliver outcomes that matter to our partners and our communities." – Professor Janet Nelson, Deputy Vice-Chancellor, Research and Innovation

To learn more about the University of Newcastle's Covid Response Initiative contact:

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